

CLAIMS

1. Method for performing event detection and object tracking in image streams, comprising:

a) installing in field, a set of image acquisition devices, each of which comprising a local programmable processor for converting the acquired image stream, consisting of one or more images, to a digital format, and a local encoder, for generating, from said image stream, features, being parameters related to attributes of objects in said image stream, and for transmitting a feature stream, whenever said motion features exceed a corresponding threshold;

b) connecting each image acquisition device to a data network through a corresponding data communication channel;

c) connecting an image processing server to said data network, said server being capable of determining said threshold, and of processing said feature stream; and

d) whenever said server receives features from a local encoder through its corresponding data communication channel and said data network, obtaining indications regarding events in said image streams by processing, by said server, said feature stream, and transmitting said indications to an operator.

2. Method according to claim 1, wherein the local encoder is a composite encoder, being the local encoder that further comprises circuitry for compressing the image stream, said composite encoder being capable of operating in a first mode, during which it generates and transmits the features to the server, and in a second mode, during which it transmits to said server, in addition to said features, at least a portion of said image stream in a desired compression level, according to commands sent from said server.

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3. Method according to claim 2, further comprising,
controlling each composite encoder, by a command sent from said server,
to operate in its first mode;
as long as the server receives features from a composite encoder:
a) controlling that composite encoder, by a command sent from said server,
to operate in its second mode; and
b) obtaining indications regarding events in said image streams by
processing, by said server, said feature stream, and transmitting said
indications and/or their corresponding image streams to an operator.
4. Method according to claim 1 or 2, further comprising decoding one or
more compressed image streams containing events by said server, and
transmitting the decoded image streams to the display of an operator, for
viewing.
5. Method according to claim 1 or 2, further comprising recording one or
more compressed image streams obtained while their local encoder
operates in its second mode.
6. Method according to claim 1 or 2, further comprising dynamically
allocating additional image processing resources, in the server, to data
communication channels that receive image streams.
7. Method according to claim 1 or 2, wherein one or more feature streams
obtained while operating in the first mode, comprises only a portion of the
image.
8. Method according to claim 6, further comprising generating and
displaying a graphical polygon that encompasses an object of interest,
being within the frame of an image or an AOI in said image.

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9. Method according to claim 8, further comprising generating and displaying a graphical trace indicating the history of movement of an object of interest, being within the frame of an image or an AOI in said image.

10. Method according to claim 1 or 2, wherein the image stream is selected from the group of images that comprises video streams, still images, computer generated images, and pre-recorded digital or analog video data.

11. Method according to claim 1 or 2, wherein the image streams are video streams, compressed using MPEG format.

12. Method according to claim 1 or 2, wherein during each mode, the encoder uses different resolution and frame rate.

13. Method according to claim 1 or 2, wherein the features are selected from the following group:

- motion features;
- color;
- portion of the image;
- edge data; and
- frequency related information.

14. Method according to claim 1 or 2, further comprising performing, by the server, one or more of the following operations and/or any combination thereof:

- License Plate Recognition (LPR);

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- Facial Recognition (FR);
- detection of traffic rules violations;
- behavior recognition;
- fire detection;
- traffic flow detection;
- smoke detection,

using a feature stream, received from the local encoder of at least one image acquisition device, through its data communication channel.

15. System for performing event detection and object tracking in image streams, comprising:

a) a set of image acquisition devices, installed in field, each of which includes:

a.1) a local programmable processor for converting the acquired image stream, to a digital format

a.2) a local encoder, for generating, from said image stream, features, being parameters related to attributes of objects in said image stream, and for transmitting a feature stream, whenever said motion features exceed a corresponding threshold;

b) a data network, to which each image acquisition device is connected through a corresponding data communication channel;

c); and

d) an image processing server connected to said data network, said server being capable of determining said threshold, of obtaining indications regarding events in said image streams by processing said feature stream, and of transmitting said indications to an operator.

16. System according to claim 15, in which the local encoder is a composite encoder, being the local encoder that further comprises circuitry for compressing the image stream, said composite encoder being capable of

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operating in a first mode, during which it generates and transmits the features to the server, and in a second mode, during which it transmits to said server, in addition to said features, at least a portion of said image stream in a desired compression level, according to commands sent from said server.

17. System according to claim 15 or 16, further comprising an operator display, for receiving one or more image streams that are decoded by the server and contain events.

18. System according to claim 15 or 16, further comprising a network video recorder for recording one or more image streams, obtained while their local encoder operates in its first mode.

19. System according to claim 15 or 16, in which the server is capable of dynamically allocating additional image processing resources to data communication channels that receive image streams.

20. System according to claim 15 or 16, in which one or more image streams obtained while operating in the first mode, comprises only a portion of the image that corresponds to a desired AOI.

21. System according to claim 15 or 16, in which the server further comprises processing means for generating and displaying a graphical polygon that encompasses an object of interest, being within the frame of an image or an AOI in said image.

22. System according to claim 21, in which the server further comprises processing means for generating and displaying a graphical trace

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indicating the history of movement of an object of interest, being within the frame of an image or an AOI in said image.

23. System according to claim 15 or 16, in which the image stream is selected from the group of images that comprises video streams, still images, computer generated images, and pre-recorded digital or analog video data.

24. System according to claim 15 or 16, in which the image streams are video streams, compressed using MPEG format.

25. System according to claim 15 or 16, in which during each mode, the encoder uses different resolution and frame rate.

26. System according to claim 15 or 16, in which the features are selected from the following group:

- motion features;
- color;
- portion of the image;
- edge data; and
- frequency related information.

27. System according to claim 15 or 16, in which the server further comprises processing means for performing one or more of the following operations and/or any combination thereof:

- License Plate Recognition (LPR);
- Facial Recognition (FR);
- detection of traffic rules violations;

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- behavior recognition;
- fire detection;
- traffic flow detection;
- smoke detection,

using a feature stream, received from the local encoder of at least one image acquisition device, through its data communication channel.

28. Method for performing event detection and object tracking in image streams, substantially as described and illustrated.

29. System for performing event detection and object tracking in image streams, substantially as described and illustrated.